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EXAMINER

PARK, JUNG H

ART UNIT	PAPER NUMBER
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2616

DATE MAILED: 11/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/918,020

Applicant(s)

VANGHI, VIERI

Examiner

Jung Park

Art Unit

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 50-52 is/are allowed.
- 6) ☒ Claim(s) 1, 12, 27, 35, 36, 43, 44, 53, 54 and 56 is/are rejected.
- 7) ☐ Claim(s) 2-11, 13-26, 28-34, 37-42, 45-49, & 55 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Remark

1. This communication is considered fully responsive to the Amendment mailed October 06, 2006.

Applicant's request for withdrawing finality of previous final office action, where the §103 rejection of claim 53 were only cited under §112 rejections in the 2nd Non Final Rejection, is persuasive and, therefore, the finality of that action is withdrawn because the §103 rejection of claim 53 in the first Non Final Rejection were inadvertently left out in the second Non Final Rejection. The Amendment of 10/06/06 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claim 27 is rejected under 35 U.S.C. 102(e) as being anticipated by Chung et al. (US 2002/0151310, "Chung").

Regarding claim 27, Chung disclose a method comprising regulating reverse link data rates (*para.[0052] where a reverse rate R is regulated by R_{max} that has β element*) for access terminals (16 & 18 *fig.1*) in a first sector (a sector for 16 & 18 *fig.1*) in dependence on a measured reverse link loading of a second sector (*calculated/measured rate R for sector 12 fig.1*) to reduce reverse link interference in the second sector (*para.[0049] where ...the total interference from other sectors/cells is β*

times the total in-cell interference, i.e., the reverse link interference in the sector 12 is dependent on β value in the measured rate R in the first sector; see equation in para.[0052]) caused at least in part by the access terminals controlled by the first sector (para.[0049] where ...the total interference from other sectors is β times the total in-cell interference).

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 35, 36, 43, and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Chheda (US 6,188,914, "Chheda").

Regarding claim 35, Chheda discloses a method of reverse link flow control comprising:

- receiving total sector interference estimates indicative of sector loading from a plurality of sectors (*col.2, ln.39-42 where ...receive the total interference from mobiles in all sectors to estimate reverse link capacity as described in col.2, ln.25-27*) within the network at a central processor (*BSC 18 fig.1*);
- controlling reverse link throughput in at least a first sector (*col.2, ln.25-27 estimate reverse link capacity for a sector*) in dependence on the interference estimates of at least a second sector (*col.2, ln.38-42*) to reduce interference in at least the second sector (*col.2, ln.25-42 frequency reuse factor, which is an element of N equation, is related with the total interference from mobiles in all sectors*).

Regarding claim 36, Chheda further discloses, "controlling reverse link throughput comprises adjusting one or more flow control parameters used by the first sector in regulating reverse link data rates of access terminals controlled by the first sector (col.2, ln.25-42 where ...F is the frequency reuse factor as a flow control parameter)."

Regarding claim 43, Chheda further discloses, "the method of claim 35 further comprising receiving frequency reuse efficiency estimates from the plurality of sectors (col.2, ln.38-42 where F is a frequency reuse factor)."

Regarding claim 44, Chheda further discloses, "the method of claim 43 further comprising controlling reverse link throughput in one or more sectors, including the first sector, in dependence on the interference estimates (col.2, ln.25-42)."

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chung and in view of Chheda.

Regarding claim 1, Chung discloses a determining step of i -th MS's SNR $[E_{bi}/I_{oi}]$ in para.[0060]. The individual interference I_{oi} is inversely proportional to i -th MS's SNR $[E_{bi}/I_{oi}]$ (claim - determining an individual interference contribution of each access

terminal) and N in the equation is number of mobile stations in a sector as described in the table in para.[0003] (*claim - sector*) based on a reverse data channel rate R_i (*claim - a reverse data channel rate*) of the mobile stations (*claim - access terminal*). The total sector interference is a simple summation of individual interference I_{oi} which is inversely proportional to i -th MS's SNR $[E_{bi}/I_{oi}]$ and total I_o , when user has same data rate, is shown in para.[0050] (*claim - estimating total sector interference for the sector based on the individual interference contributions of the access terminals*). The reverse rate R is upper-bounded by R_{\max} (para.[0052]; *claim - a reverse link control indicator regulating the reverse data channel rates*) based on the total sector interference I_o .

Chung teaches the total interference when the user' has same rate, but does not explicitly disclose the estimating step of total interference from access terminals within a sector. However, Chheda explicitly disclose (*in col.2, ln.25-42*) a frequency reuse factor, F , which is the ratio of the interference from mobile units within a sector to the total interference from mobiles in all sectors. That is, to estimate reverse link capacity (col.2, ln.25-27), it is required to measure an individual interference of i -th MS in order to get the value of F and then estimate total sector interference within a sector (*Chheda, col.2, ln.38-42; claim - estimating total sector interference for the sector based on the individual interference contributions of the access terminals*).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify the SNR equation to determine the individual interference contribution of each access terminal and then estimate the total sector interference taught by Chheda. The motivation of introducing this individual interference is to calculate MS's interference in order to consider users with different rates (para.[0059] & [0060]) and then calculate the total sector interference.

Regarding claim 12, it is a claim corresponding to the determining step of claim 1 and is therefore rejected for the similar reasons set forth in the rejection of claim 1.

8. Claims 53-54 are rejected under 35 U.S.C. 103(a) as being unpatentable by Chheda in view of Chung and further in view of Bender (US 2003/0076795, "Bender").

Regarding claim 53, Chheda discloses a base station controller comprising a central processor programmed to receive estimates of reverse link loading (*col.2, ln.25-42 receive the estimated reverse link capacity at BSC 18 fig.1*) for a sector (*S1 fig.1*) from a plurality of radio base stations (*B1 & B2 fig.1*); and process the estimates of reverse link loading from the plurality of radio base stations (*col.2, ln.25-42 where BSC 18 receives estimated reverse link loading for a sector including frequency reuse efficiency from base stations by using equation (2) as described in col. 2, lines 25-42 and process the sector loading estimation*).

Chheda lacks what Chung discloses, "to compute a flow control parameter (*para.[0016] where there are four control parameters*) for one or more of the radio base stations." Chheda further discloses, "the flow control parameter computed for each radio base station is dependent on a sector loading estimate for at least one other radio base station (*para.[0060] where there is an inter-sector interference which depends on a sector loading estimation for one or more radio stations*)." Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to apply one of flow control parameters taught by Chung to the method of link capacity estimation disclosed by Chheda since one would be motivated to manage flow control by considering users with different rates.

Chung and Chheda do not explicitly mention that if the reverse link estimation method applied to each base station is combined in BSC. However, Bender discloses that the reverse link signals received by base stations are soft combined in base station controller to provide a better estimation (Bender, para.[0027]). Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to apply the combine method taught by Bender into Chung-Chheda in order to have a better combined estimation in base station controller.

Regarding claim 54, Chheda further discloses, "receive frequency reuse efficiency estimates (col.2, ln.38-42)."

Regarding claim 56, Chung is silent on what Chheda and Bender disclose, "the central controller (*Chheda, 18 fig.1*) is further programmed to send the flow control parameters to the radio base stations (*Bender, para.[0027]* where BSC is to provide a better estimate of the information transmitted by base stations. Therefore, it is inherent to have a kind of program to send the flow control parameters to the radio stations in order to function as a central controller)." This claim is rejected for the same reasons and motivation set forth in the rejection of claim 55.

Allowable Subject Matter

9. **Claims 50-52** are allowed.
10. Claims 2-11, 13-26, 28-34, 37-42, 45-49, and 55 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

11. Applicant's arguments filed Oct. 6, 2006 have been fully considered but they are not persuasive.

Independent Claim 27

At page 3, applicant argues, "Nothing in Chung teaches or suggests that the reverse link loading of a second sector is nearly proportional to β times the measured total in-cell interference". In reply, Chung teaches that the reverse link data rate is nearly proportional to the interference as described in ¶ [0048] and also teaches that the total interference from other sector/cells is β times the total in-cell interference as described in ¶ [0049]. Therefore, the reverse link interference in a second sector 12, which is proportional to the reverse link loading of a second sector 12, is dependent on β value in the estimated rate R in the first sector (see equation in para.[0052]).

Further, at page 4, applicant argues, "Chung does not teach or suggest measuring or even estimating the actual reverse link loading from other sectors." In reply, Chung mentions that the estimated total interference, which is proportional to reverse link capacity, from other sectors/cells is β times the total in-cell interference as described in ¶ [0049], i.e., the estimated actual reverse link loading of a second sector is nearly proportional to β times the measured total in-cell interference.

Further, at page 4, applicant argues, "Nothing in Chung teaches that R_{\max} actually regulates the actual data rate." In reply, the reverse link rate R is should be less than R_{\max} , therefore, R is regulated by R_{\max} .

Independent Claim 35

At page 5, Applicant argues, "Nothing in Chheda teaches regulating throughput." In reply, the reverse link capacity equation in column 2 of Chheda is used for controlling reverse link throughput by estimating the reverse link capacity since in information technology, **throughput** is the rate at which a computer or network sends or receives data. It therefore is a good measure of the channel capacity of a communications link.

Independent Claim 1

At page 5, applicant argues, "there is no motivation to combine Chheda with Chung." In reply, the equations are for estimating "reverse link rate (capacity)". Therefore, there is a motivation to combine the teaches from Chheda and Chung.

Further, Applicant argues, "neither Chung nor Chheda teach estimating a total sector interference based on individual interference contributions from access terminal in the sector." In reply, the total sector interference is a simple summation of individual interference I_{oi} which is inversely proportional to i -th MS's SNR $[E_b/I_{oi}]$ and total I_o , when user has same data rate, is shown in para.[0050]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention was made to simply add the individual interferences to have total interference since it has been held that the simple addition of individual values, where needed, involves only routine skill in the art.

Independent Claim 53

At page 7, Applicant argues, "Nothing in Chheda teaches that radio base stations actually calculate loading or send the calculated loading to a base station controller (BSC)." In reply, Chheda estimates the reverse link loading using equation (2) for plurality of radio base stations as shown in 18 Figure 1 and Bender teaches that the

reverse link signals received by base stations are soft combined in BSC to provide a better estimation (Bender, para.[0027]). Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention was made to simply add individual estimation of reverse link loading at BSC as disclosed by Bender.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jung Park whose telephone number is 571-272-8565. The examiner can normally be reached on Mon-Fri during 6:10-3:40.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on 571-272-3126. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2616

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JP
Jung Park
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